

REMARKS

Reconsideration and allowance of the above-identified application in view of the above amendments and the following remarks are respectfully requested. New claims 26-40 have been added merely to provide dependent claim support to pending independent claims 1, 22 and 23. No new matter has been added. Claims 1-5 and 22-40 are pending in the Application.

Claims 1-5 and 22-25 were rejected under 35 U.S.C. § 102(b) over United States Patent No. 5,608,773 to Korenaga et al. ("Korenaga et al."). Applicant respectfully traverses this rejection for at least the following reasons.

Korenaga et al. disclose a X-ray mask comprising a mask substrate 3 having a mask membrane 2, on which a transfer pattern 4 is formed, bonded on the surface of a mask frame 1. A conical-hole portion 5, a V-groove portion 6, and a flat portion 7, for contacting three spheres 10 provided on the mask chuck 11, are provided at the back of the mask frame 1. Korenaga et al., col. 5, lines 43-51. The mask chuck 11 is provided on the main body of the exposure apparatus. Engaging holes 12 are provided at three portions, which correspond to the above-described conical-hole portion, V-groove portion and flat portion, on the surface of the mask chuck 11, and the three spheres 10 are fixed in the engaging holes 12. Korenaga et al., col. 5, lines 62-67. In order to mount the X-ray mask on the X-ray apparatus, the mask frame 1 is positioned by a mask hand (not shown) so that the conical-hole portion 5, the V-groove portion 6 and the flat portion 7 of the mask frame 1 contact the corresponding three spheres 10 on the mask chuck 11, and the current supply to the coils 15 of the electromagnet units 13 is thereafter interrupted. In this state, the three magnetic rings 8 are attracted toward the mask chuck due to the magnetic lines of force of the permanent magnets 14 while maintaining a fine gap with the surfaces of the yokes 16, and the X-ray mask is fixed by making the three spheres 10 mechanical references. Korenaga et al., col. 7, lines 9-19.

Applicant respectfully submits that Korenaga et al.'s disclosure in this regard is substantially similar to the disclosure in European Patent Application Publication No. 0789280 to Chiba et al., which was previously cited by the Office and overcome by Applicant.

Specifically, Korenaga et al. merely disclose structures consisting of a conical-hole portion 5, a V-groove portion 6 and a flat portion 7 which are located on the mask frame 1 and structures consisting of spheres 10 which are located on the mask chuck 11. Thus, clearly, Korenaga et al. do not disclose, teach or suggest connecting structures or surfaces on

the mask. In fact, Korenaga et al. use a (Si) substrate 3 to retain a membrane having the mask pattern and the mask frame 1 holds an outer peripheral portion of the substrate.

Consequently, contrary to Examiner's contention, the cited portions of Korenaga et al. do not disclose, teach or suggest "the holding comprising cooperation between a first set of connecting structures on the mask and a respective second set of connecting structures on a gripper," as recited in claim 1. Similarly, the cited portions of Korenaga et al. do not disclose, teach or suggest "kinematically determined holding comprising cooperation of a set of structures on a gripper with a respective set of structures provided in a circumferential region of the mask," as recited in independent claim 22. Further, the cited portions of Korenaga et al. do not disclose, teach or suggest "the mask having an imaging portion and locating surfaces fixed with respect to the imaging portion," as recited in independent claim 23.

Furthermore, Korenaga et al.'s structure does not allow a mask to be self-aligning in a horizontal direction. For example, Korenaga et al.'s use of a conical portion would not enable a mask to be self-aligning in a horizontal direction. Thus, the cited portions of Korenaga et al. do not disclose, teach or suggest "holding the mask while handling the mask such that the mask is self-aligning in a horizontal direction," as recited in independent claim 1. Further, the cited portions of Korenaga et al. do not disclose, teach or suggest "the mask is self aligning in a horizontal direction," as recited in independent claims 22 and 23.

Therefore, Applicant respectfully submits that claims 1, 22 and 23 are allowable. Claims 2-5 and 26-28 depend from independent claim 1, claims 29-34 depend from independent claim 22, and claims 24-25 and 35-40 depend from independent claim 23, and are, therefore, patentable over the cited portions of Korenaga et al. for at least the same reasons provided above related to, respectively, claims 1, 22 and 23, and for the additional features recited therein. Thus, Applicant respectfully requests that the rejection of claims 1-5 and 22-25 under § 102(b) over Korenaga et al. be withdrawn and the claims allowed.

Claims 1-5 and 22-25 were rejected under 35 U.S.C. § 103(a) over Korenaga et al. or U.S. Patent No. 6,717,159 to Novak ("Novak"). Applicant respectfully traverses this rejection for at least the following reasons.

As discussed above, the cited portions of Korenaga et al. fail to disclose, teach or suggest independent claims 1, 22 and 23. Claims 2-5 and 26-28 depend from independent claim 1, claims 29-34 depend from independent claim 22, and claims 24-25 and 35-40 depend from independent claim 23, and are, therefore, patentable over the cited portions of Korenaga et al. for at least the same reasons provided above related to, respectively, claims 1, 22 and 23, and for the additional features recited therein.

Further, the cited portions of Novak fail to overcome the shortcomings of Korenaga et al. or independently disclose, teach or suggest independent claims 1, 22 and 25.

Novak merely discloses protrusions 102 that are preferably evenly distributed along the periphery of reticle membrane 112 and total three in number. In a preferred embodiment, hemispherical protrusions 102 are set into and are supported by seats 104 of conical cross-section. Seats 104 are in turn connected to flexures 106. Flexures 106 are members that limit each seat 104 to translation in its specific radial direction as indicated by arrows A, B and C. The combined effect of limiting seats 104 to radial translations A, B, and C is that a reticle is allowed to undergo planar expansion without the resulting stresses that would occur if protrusions 102 were constrained in the direction of planar expansion. Novak, col. 4, lines 20-44.

Thus, Novak's use of seats of conical cross-section would not enable a mask to be self-aligning in a horizontal direction. Each protrusion 102 would have to be accurately aligned with each seat 104 and, for example, the placement of one or more protrusions 102 in one or more seats 104 would not enable the mask to be self-aligning in a horizontal direction. Similarly, the flexures 106 do not enable the mask to be self-aligning in a horizontal direction as the flexures 106 merely permit Novak's mask to expand and do not address alignment of the mask.

Thus, the cited portions of Novak do not disclose, teach or suggest "holding the mask while handling the mask such that the mask is self-aligning in a horizontal direction," as recited in independent claim 1. Further, the cited portions of Novak do not disclose, teach or suggest "the mask is self aligning in a horizontal direction," as recited in independent claims 22 and 23.

Claims 2-5 and 26-28 depend from independent claim 1, claims 29-34 depend from independent claim 22, and claims 24-25 and 35-40 depend from independent claim 23, and are, therefore, patentable over the cited portions of Korenaga et al., Novak and any proper combination thereof for at least the same reasons provided above related to, respectively, claims 1, 22 and 23, and for the additional features recited therein.

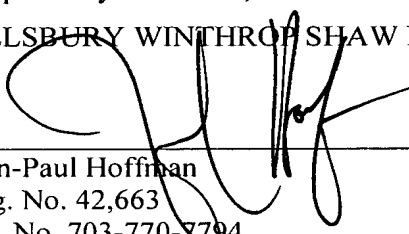
Therefore, Applicant respectfully submits that the Examiner has failed to make a prima facie case of obviousness and that claims 1-5 and 22-25 are believed to be allowable over the cited portions of Korenaga et al., Novak and any proper combination thereof. Thus, Applicant respectfully requests that the rejection of claims 1-5 and 22-25 under §103(a) over Korenaga et al., Novak and any proper combination thereof, should be withdrawn and the claims be allowed.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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